

## **REMARKS**

This communication is a full and timely response to the aforementioned non-final Office Action dated June 1, 2010. By this communication, claims 1, 4-9 and 11-20 are amended. Claims 2, 3 and 10 are not amended and remain in the application. Thus, claims 1-20 are pending in the application. Claim 1 is independent.

Reconsideration of the application and withdrawal of the rejections of the claims are respectfully requested in view of the foregoing amendments and the following remarks.

### **I. Rejections Under 35 U.S.C. § 102**

Claims 1, 4, 5 and 11 are rejected under 35 U.S.C. § 102(b) as being anticipated by DE 3724349 (hereinafter "DE publication").

This rejection is respectfully traversed, because the DE publication does not disclose or suggest all the recited features of the claimed invention, for at least the following reasons.

With reference to Figure 1, for example, an exemplary embodiment of the present disclosure provides a rotary transformer that includes at least one primary winding and at least one secondary winding which are configured to move in rotary fashion with respect thereto. The primary winding and the secondary winding are each divided into at least two separate winding sections, which interengage in the manner of a comb. For example, as illustrated in Figure 1, the primary winding includes winding sections 11, 12, 13, 14 and 15, and the secondary winding includes winding sections 18, 19, 20, 21 and 22.

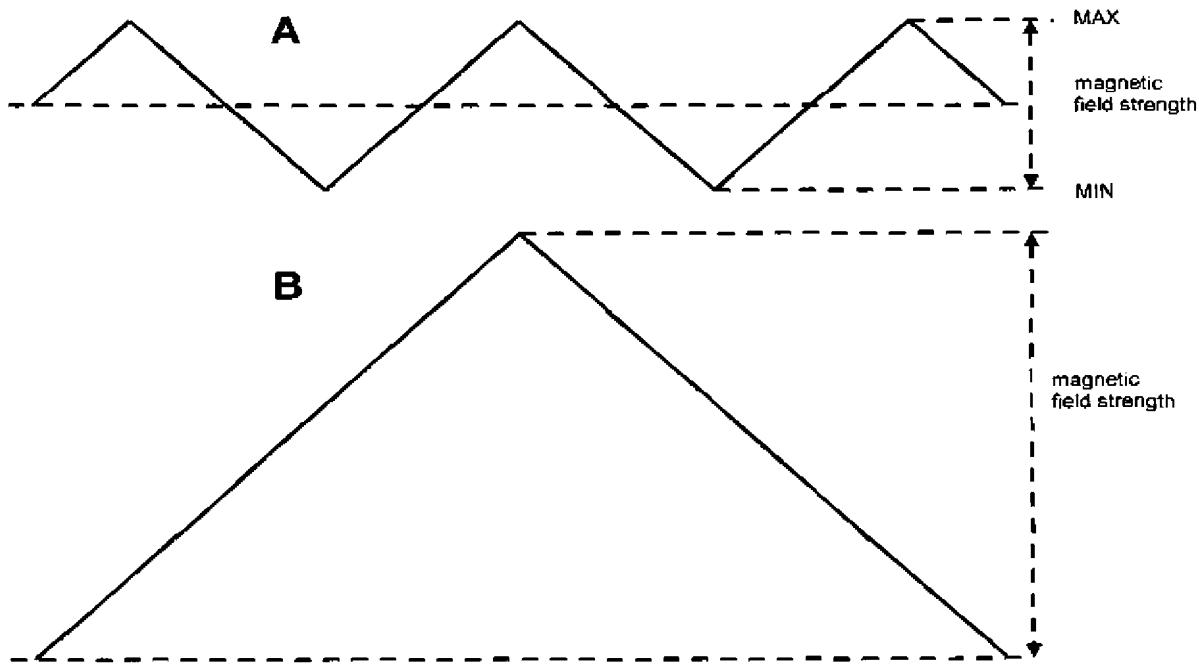
The disclosed embodiment provides that the winding sections are arranged such that the current flow of adjacent winding sections among the primary and secondary windings, which lie directly opposite one another so as to form an air gap 8 between the adjacent winding sections, is in the opposite direction between the adjacent winding sections. For example, as illustrated in Figure 1, winding sections of the primary winding (p) and winding sections of the secondary winding (s) are arranged in the following adjacent pairs: 11 (p)/ 18 (s); 19 (s)/ 12 (p); 13 (p)/20 (s); 21(s)/ 14 (p); 15 (p)/22 (s). In these adjacent wiring sections among the primary and

secondary windings, current in each case flows in the opposite direction. For example, in the exemplary illustration of Figure 1, current flow is in the opposite direction between wiring section 11 of the primary winding and wiring section 18 of the secondary wiring.

This exemplary arrangement of the wiring sections of the primary and secondary windings advantageously provides, for example, that the magnetic field strength caused by this current flow increases and decreases in an alternating manner, as shown in Figure 6 of the present application, for example. For instance, as shown in Figure 6, the magnetic field strength:

- increases from 0 to MAX over the winding section 11 of the primary winding;
- falls to 0 and MIN over the winding sections 18 and 19 of the secondary winding;
- increases to 0 and MAX over the winding sections 12 and 13 of the primary winding;
- falls to 0 and MIN over the winding sections 20 and 21 of the secondary winding;
- increases to 0 and MAX over the winding sections 14 and 15 of the primary winding; and
- falls to 0 over the winding sections 22 of the secondary winding.

Part A of the explanatory drawing below illustrates this alternative increasing/decreasing due to the arrangement of the wiring sections in which current through adjacent wiring sections among the first and second primary windings flows in the opposite direction between the adjacent winding sections, according to the above-described exemplary embodiment.



As shown in Part A of the diagram above, the zigzag profile for the magnetic field strength between a maximum value MAX and a minimum value MIN is achieved due to the arrangement of the winding sections of the primary and secondary windings interengaging in the manner of a comb and the current flow of adjacent wiring sections among the primary and secondary windings being in the opposite direction.

Conversely, if one were to arrange all of the winding sections of the primary winding next to each other and all of the winding sections of the secondary winding likewise next to each other, to form the primary and secondary windings opposite to each other, the maximum MAX value of the magnetic field strength of a winding distributed in this manner would be a multiple higher (see part B of the diagram above) than the maximum value achieved in the arrangement according to the above-described exemplary embodiment. According to the arrangement illustrated in part B, the transformer losses and the leakage would be a multiple greater, which would result in a relatively low degree of efficiency for the rotary transformer.

Claim 1 recites various features of the above-described exemplary embodiment and achieves the profile for the magnetic strength according to part A of the above explanatory diagram, due to the arrangement of the winding sections of the primary and secondary windings.

In particular, claim 1 recites that the rotary transformer comprises at least one primary winding and at least one secondary winding which are each divided into at least two separate windings, which interengage in the manner of a comb.

In addition, claim 1 recites that the winding sections are arranged such that the current flow of adjacent winding sections among the primary and secondary windings, which lie directly opposite one another so as to form an air gap 8 between the adjacent winding sections, is in the opposite direction between the adjacent winding sections.

The DE publication does not disclose or suggest the above-described features of claim 1. On the contrary, the DE document discloses that metal foils 7 made by a magnetic inactive material such as copper, aluminum or brass are provided to effect a magnetic separation between winding pairs. This disclosure, however, is opposite to the features of the claimed invention.

Moreover, the DE publication does not disclose or suggest the feature of primary and secondary windings each being divided into at least two separate winding sections that interengage in the manner of a comb, where adjacent winding sections among the primary and secondary windings are arranged such that current flow of the adjacent wiring sections, which lie directly opposite to one another, is in the opposite direction between the adjacent wiring sections.

Accordingly, Applicants respectfully submit that claim 1 is patentable over the DE publication, since the DE publication does not disclose or suggest all the recited features of claim 1.

### **III. Rejections Under 35 U.S.C. § 103**

Dependent claims 2 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the DE publication in view of EP 0680060 (hereinafter "EP publication").

Similar to the DE publication, the EP publication does not disclose or suggest the feature of primary and secondary windings each being divided into at least two separate winding sections that interengage in the manner of a comb, where adjacent winding sections among the primary and secondary windings are arranged such that current flow of the adjacent wiring sections, which lie directly opposite to one another, is in the opposite direction between the adjacent wiring sections, as recited in claim 1.

Consequently, the EP publication cannot cure the deficiencies of the DE publication for failing to disclose or suggest all the recited features of claim 1.

Therefore, Applicants respectfully submit that claim 1 is patentable over the DE publication and the EP publication, since these references, either individually or in combination, fail to disclose or suggest all the recited features of the claimed invention.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that claim 1 is patentable over the applied references.

Dependent claims 2, 4, 5, 11 and 14 recite additional distinguishing features over the applied references are also patentable by virtue of depending from claim 1. The foregoing explanation of the patentability of independent claim 1 is sufficiently clear such that it is believed to be unnecessary to separately demonstrate the additional patentable features of the dependent claims at this time. However, Applicants reserve the right to do should it become appropriate.

### **III. Withdrawn Claims**

Claims 3, 6-10, 12, 13 and 15-20 were withdrawn from consideration. The withdrawn claims each depend, either directly or indirectly, from claim 1, which is patentable for at least the reasons presented above. Accordingly, Applicants respectfully submit that withdrawn claims 3, 6-10, 12, 13 and 15-20 are entitled to rejoinder and allowance.

### **IV. Conclusion**

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. Accordingly, a

favorable examination and consideration of the instant application are respectfully requested.

If, after reviewing this Amendment, the Examiner believes there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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